SPECIAL OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING FEBRUARY, 1920.

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[Pending a decision as to an appropriate reduced form in which to present these data, publication will be delayed.]

MEASUREMENTS OF THE SOLAR CONSTANT OF RADIATION AT CALAMA, CHILE, JANUARY, 1920.

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[Astrophysical Observatory, Smithsonian Institution, Washington, Mar. 30, 1920.]

In continuation of preceding publications I give in the following table the results obtained at Calama, Chile, in January, 1920, for the solar constant of radiation. The reader is referred to this REVIEW for February, August, and September, 1919, for statements of the arrangement and meaning of the table.

The high values which prevailed during the latter half of October and the months of November and December have continued through January; indeed have reached almost unprecedentedly high values. The observers report exceptional cloudiness, so that if it were not for the new method they would not have been able to observe more than two or three times during the month. The three observations which they did make by the older method agree quite as closely as could be expected with those by the new, so that it seems justified to believe that the extraordinarily high values correspond to real conditions on the sun. Readers may recall that a secondary correction for humidity is employed at Mount Wilson, but not at Calama. It is not surprising, therefore, that on such very humid days as January 19 and January 25 values by the old method should have fallen as much as 1 per cent below those by the new.

In view of this paradoxical phenomenon of high solar radiation and uncommonly low temperatures in the United States, with exceptional cloudiness and precipitation here and elsewhere, attention is drawn to the well-verified fact that the temperatures are lower during periods of sun-spot maximum than at times of sun-spot minimum. The mean values of solar radiation, however, were several per cent higher in the periods of many sun spots, 1905 to 1909 and 1914 to 1919, than they were in the period of few sun spots, 1910 to 1913. It may be supposed that attending great solar activity conditions are favorable for exceptional cloudiness, and this, by reflecting away the solar radiation, diminishes the amount available to warm the earth, so that the high solar radiation and low terrestrial temperature may therefore be rendered consistent with each other. Another hypothesis may be that increased solar radiation alters the positions of the great action centers in the atmosphere so that prevailingly polar winds are substituted for prevailingly equatorial winds attending high values of the solar radiation.

Date.	Solar constant.	Method.	Grade.	Transmission coefficient at 0.5 micron.	Humidity. ρ/ρ s.c.	Humidity. V. P.	Humidity. Relative humidity.	Remarks.
1920. A. M.	*Cal.*					*Cm.*	%	
Jan. 2	1.971	E_9	E—	0.853	0.454	0.51	48	Distant cirri in east and north.
	1.974	M_3						
	1.973	M_3						
	1.959	$M_{1.6}$						
	1.970	W. M.						
3	1.985	M_2	S—	.842	.485	.46	32	Cirri in distant east and north.
	1.967	$M_{1.5}$						
	1.976	W. M.						
4	1.969	M_2	S	.848	.526	.44	32	Cirri in north and east below sun.
	1.959	$M_{1.5}$						
	1.964	W. M.						
5	1.964	$M_{1.25}$	S—	.848	.593	.47	31	Cirri over most of sky, but clear space around sun.
P. M. Jan. 7	1.977	$M_{2.13}$	U+	.828	.338	.51	23	Cirro-cumuli in east. Very thin cirri over much of west.
A. M. Jan. 10	2.027	M_2	U+	.829	.319	.44	31	Thin cirri scattered around much of sky.
11	1.979	$M_{1.39}$	U+	.819	.368	.58	39	Scattered cirri preventing earlier observations.
12	1.955	$M_{1.62}$	S—	.822	.425	.90	51	Scattered cirri in east. Cumuli all around horizon, especially in east.
	1.955	$M_{1.61}$						
	1.955	W_1 M.						
14	1.962	M^1	U+	.844	.527	.75	42	Thin cirri scattered about sky.
15	2.016	M_2	U+	.814	.330	.59	44	Cirri scattered around horizon.
	1.992	$M_{1.5}$						
	2.000	W. M.						
17	2.030	M_2	U+	.813	.308	.79	56	Some thin cirri around horizon and few cumuli in east.
	1.983	$M_{1.5}$						
	1.995	W. M.						
18	1.996	M_2	U+	.817	.319	.84	54	Some cirri low in east. Small cumuli in north and south.
	1.971	$M_{1.5}$						
	1.981	W. M.						
19	1.956	E_9	G	.834	.251	.75	61	Some cirri in north.
	2.053	M_3						
	2.011	M_2						
	1.976	$M_{1.5}$						
	1.989	W. M.						
20	1.947	$M_{1.5}$	U+	.816	.359	.75	50	Cirri around sun, but disappearing. Cumuli in north.
21	1.971	M_2	U	.813	.302	.75	53	Cirri in east, north, and south.
	1.921	$M_{1.39}$						
	1.954	W. M.						
22	1.973	$M_{1.18}$	U+	.829	.412	.89	56	Cirro-cumuli scattered about sky.
23	2.006	M_2	S	.834	.330	.71	47	Cumuli low in east and cirro-cumuli in northwest.
	1.997	$M_{1.36}$						
	2.001	W. M.						
24	2.006	M_2	S—	.826	.319	.71	50	Cirro-cumuli over most of sky.
	1.981	$M_{1.5}$						
	1.998	W. M.						
25	1.957	E_9	VG—	.838	.275	.67	57	Some cirro-cumuli low in east.
	2.008	M_3						
	1.979	M_2						
	1.969	$M_{1.9}$						
	1.978	W. M.						
26	1.958	$M_{1.08}$	S—	.837	.464	.75	44	Cirri scattered about sky.
27	1.977	M_2	S	.835	.318	.66	37	Few cumuli at eastern horizon.
	1.971	$M_{1.5}$						
	1.975	W. M.						
28	1.977	M_2	S	.837	.331	.52	32	Cirri in west and south. Cumuli forming at horizon in east.
	1.964	$M_{1.6}$						
	1.973	W. M.						
29	1.963	$M_{1.18}$	U+	.817	.410	.88	50	Cirri scattered about sky.
30	1.976	$M_{1.28}$	S—	.825	.376	.73	46	Cirri scattered over much of sky.
31	1.983	M_3	S—	.820	.303	.83	63	Scattered cumuli around north. Cirri and cumuli in south.
	1.952	$M_{1.6}$						
	1.975	W. M.						

THE RELATION BETWEEN SIMULTANEOUS VARIATIONS OF PRESSURE AND SOLAR ACTIVITY.[1]

By S. HANZLIK.

[Reprinted from *Science Abstracts*, Sect. A., July, 1918, p. 287.]

At times of sun-spot minima the conditions of pressure over the west coasts of the European and North American Continents are such that high pressure in the western United States corresponds with low pressure in western Europe, and vice versa. At times of sun-spot maxima the reverse is the case; that is, weather conditions in the two regions are similar, fine weather being experienced simultaneously and stormy weather likewise occurring at the same time in both places.—*R. C.*

[1] Akad. Wiss. Wien, Ber. 126, 3pp., 371-386. 1917.